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E-BRIEF

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EDUCATION PAPERS

Identifying Alberta's Best Schools

by
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- This study compares student outcomes at Alberta schools where students come from similar socio-economic backgrounds, and identifies top-performing schools where principals, teachers and staff are making a positive difference in student performance.
- The study screens out the influence of socio-economic factors on how a school's students perform on Alberta's Provincial Achievement Tests for grades 3, 6 and 9. This "apples-to-apples" approach identifies those schools that perform better or worse than other schools with students of similar backgrounds.
- The resulting school ratings by percentile are useful not only to parents, but to teachers, school board administrators and education officials who wish to identify schools whose practices deserve imitation.

How do parents, teachers, taxpayers and school administrators know how well individual elementary schools in Alberta perform for children? Can we compare the overall performance of students at charter schools, private schools, public and separate schools? This E-Brief compares student outcomes across schools where students come from similar socio-economic backgrounds, an

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apples-to-apples approach that is a substantial improvement over other studies that do not provide such a comparison. The purpose of this analysis is not to rank schools, but rather to provide useful indicators of high- and low-performing schools whose practices deserve further investigation. Among our key findings: charter schools, although small in number, generate much better results than other schools.

Alberta Education conducts standardized achievement tests for students in Grade 3 in languages and mathematics. Students in grades 6 and 9 are tested in languages, mathematics, science and social studies. These are known as the Provincial Achievement Tests (PATs).[1] About 40 percent of the variation in schools' standardized test scores (averaged over many tests over many years) is explained by differences in schools' socio-economic environments. It is reasonable to infer that much of the remaining variation reflects the effect of factors specific to a school, such as the principal, the teachers and the other staff. Adjusting test scores to remove the influence of the socio-economic factors yields measures of relative school performance that are much more representative of a school's effectiveness than rankings based on raw standardized test results.

Measuring Actual School Performance

This report updates and extends my analysis of Alberta schools (Johnson 2007, 2010) using achievement test results in 2009/10, 2010/11, and 2011/12 for grades 3, 6 and 9.[2]

The first step in creating the ratings is to determine how students at Alberta schools did on these assessments, specifically the percentage of students who achieve the "standard of excellence" on Alberta PATs.[3] In each school, in each year, I subtract the percentage of all students in a grade and language group who achieve excellence from the provincial average for that grade and language.[4] The vertical axis of Figure 1 shows the difference between the percent of students in Grade 6 at a school who achieved excellence over the three-year period and the average provincial rate of excellence (averaged over the four Grade 6 PATs).[5] A value of 10 indicates that a school

1 I use scores for 850 schools with Grade 3 classes, 802 schools with Grade 6 classes and 457 with Grade 9. By using larger schools where 45 or more students over three years participate in language tests, I exclude small schools from any comparisons.

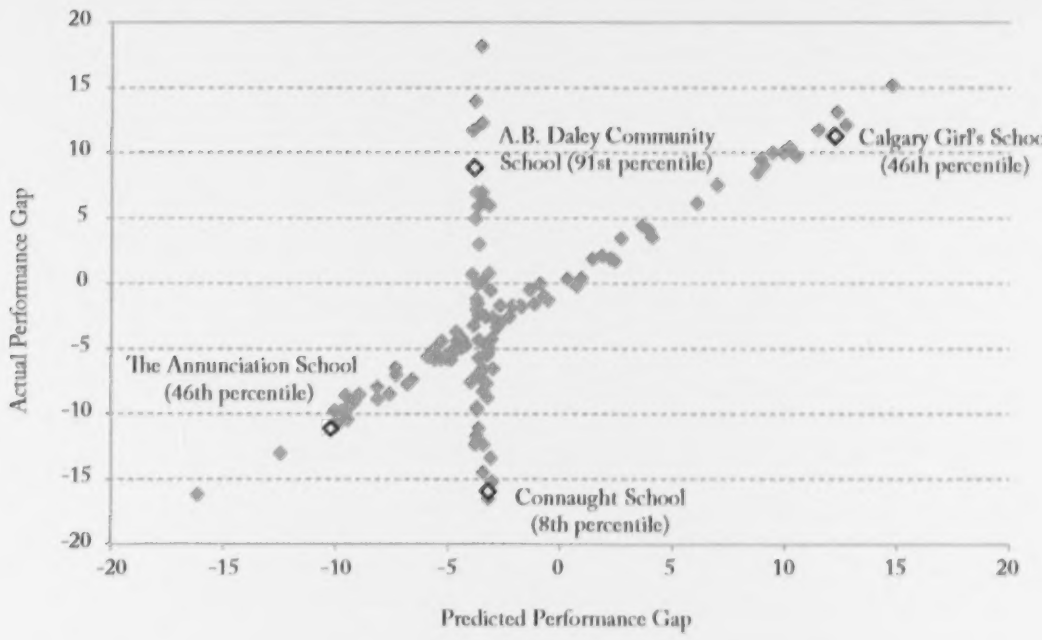
2 I perform separate analyses for grades 3, 6 and 9.

3 In 2009/10, approximately half of students in grades 3, 6 and 9 wrote a Form 2 test in mathematics. Alberta Education does not report the results of the Form 2 test. I only include two mathematics tests – 2010/11 and 2011/12 – in my analysis.

4 I conduct this test separately for each language of assessment. I weight each year by the proportion of students taking each type of test by language. Then, I weight the results across all years by the number of students in the school in each of the three years. I average either the two subjects, language and mathematics, in Grade 3 or the four subjects, language, mathematics, science and social studies, in Grades 6 and 9 to provide a final measure of performance. I include all students in the language-grade group at the school as the base for calculating the percent who achieve excellence. Because I include all students in the denominator for the percentage calculation, a school cannot increase the percentage of students achieving the standard of excellence by encouraging students who would not attain this standard to avoid the PAT. If a school manipulates participation in the PAT and excludes students who would not achieve the standard of excellence, then the percentage of students who write the PAT and achieve the standard of excellence is a very misleading measure of school achievement. I use the percent excellent rather than the percent acceptable because, at a significant number of schools in Alberta all, or nearly all, students achieve the percent acceptable and there is no variation in results.

5 Similar figures could be drawn for grades 3 or 9.

Figure 1: Actual and Predicted Test Scores of Selected Alberta Grade 6 Schools



Note: The performance gap, which may be positive or negative, is the difference between the percentage of students at a particular school – who meet or exceed the standard of excellence – less the province-wide average percentage of students who meet or exceed the standard.

Source: Author's calculations from Statistics Canada and Alberta Education.

outperformed the provincial average by 10 percentage points in terms of the share of students who achieved the standard of excellence.

Creating a Socio-economic Picture of the Student Body at Each School

The next step creates a social and economic profile of each school; that is, characterizes the background of the school's student body. First, I link the location of students' homes to very small geographic units.[6] I use detailed socio-economic data in the 2006 Census as well as the location of student homes at each school in the academic year 2010/11 to draw a picture of the neighborhoods of students for most schools.

6 The details of this process can be found in chapter three of *Signposts of Success* (Johnson, 2005) and are summarized in the online Appendix at http://www.edhowe.org/albertas-best-schools-2013/22531.

Comparing the Performance of Schools

The horizontal axis of Figure 1 presents the predicted percentage of students at a school who achieve excellence relative to the provincial average – based on the socio-economic composition of the students who attend this school.[7]

The upward-sloping diagonal line of points from schools in Figure 1 represents my estimated relationship between socio-economic characteristics of a school's students and the measure of school success. This line uses 79 of 802 Grade 6 schools. These 79 Grade 6 schools are those where the performance of students is close to that predicted by the socio-economic environment from which the school draws its students.[8] One such school, The Annunciation School, in Edmonton, had 11 percentage points less of its students achieve that the standard of excellence over three years than the provincial average. Another school, the Calgary Girl's School, had 11 percent more of its students achieve the standard of excellence than in the province as a whole. However, the 22 percentage point difference in results between Annunciation and the Calgary Girl's School may be attributed to differences in the social and economic background of their students. The teachers and other staff at the 79 schools along the diagonal line perform at the level predicted by the social and economic composition of their student body. It is the schools on the vertical line of observations in Figure 1 that are of central interest.

The 50 schools along the vertical line of Figure 1 have a similar mix of students whose socio-economic characteristics predict that their students will perform at between 3 and 4 percentage points below the provincial average – to use an arbitrary example of score ranges – in terms of achieving the standard of excellence. The actual percentage of students above (or below) the provincial average ranges from 18 percentage points above to 16 percentage points below. At A.B. Daley Community School, for example, 9 percent more students in Grade 6 achieved the standard of excellence than the provincial average, while at the Connaught School 16 percent fewer students achieved the standard of excellence than the provincial average. The A.B. Daley Community School is a better performing school than Connaught School because, with similar students, student performance at A.B. Daley is better than student performance at Connaught School.

Interpreting the Relative School Performance Measures

I express the differences between the actual and predicted test scores of all Alberta schools as a percentile. A percentile score of 50 indicates that, compared to schools with students that have similar social and economic characteristics, a school is average: half of other schools are better and half are worse. On the other hand, a percentile score of 90 says that a school is better than 90 percent of schools whose students have similar social and economic characteristics. This would be a good, indeed a great, school.

Annunciation School and the Calgary Girl's School both have percentile scores of 46. A.B Daley has a percentile score of 91 and Connaught School has a percentile score of 8. Percentile scores for all scores are available at http://www.cdhowe.org/albertas-best-schools-2013/22531.

7 The details of this calculation are in the online Appendix.

8 For the 79 schools on this line, the difference between the actual percentage of excellent students and the predicted percentage of excellent students is less than 1 percentage point.

Comparing schools now becomes an exercise in the interpretation of these percentile numbers. There is no significant difference between schools with percentiles of 98 and 97 and even between schools with scores of 95 and 90. However, if one school is at the 90th percentile and another school is in the 10th percentile, it is very likely that the staff members at the 90th percentile school are doing a better job than those at the 10th percentile school. Differences of this magnitude are worth understanding.

In some cases, the differences are easy to understand. The two lowest percentile schools in Alberta in Grade 6 are the Foothills Academy and the Calgary Academy. These two schools focus on meeting the needs of the learning disabled. That these two schools are the lowest percentile schools is a validation of the methodology. But there are many other schools with low percentile ratings to investigate.

Identifying Alberta's Best Schools

There are excellent schools in Alberta and they stand out. Table 1 lists 12 schools, in alphabetical order, scoring above the 80th percentile in all three grades. This suggests that the strong performance is related to factors that are present in all grades at these schools. Many elementary schools in Alberta do not include Grade 9. I also list 26 schools at which the percentile ratings in both Grade 3 and Grade 6 exceed the 90th percentile (Table 2). This list includes public, separate, private and charter schools. Alberta Education authorities, teachers and principals should investigate what is happening at these strong schools that produces excellent results, and how best practices could be transferred to other schools

A Comment on Charter Schools and Private Schools

Alberta has students in private and charter schools write the PAT examinations. Of the top 12 schools in the province that offer all three grades, two are charter schools and three are private schools. Of the top 26 schools that offer grades 3 and 6, two are charter schools and three are private schools. In this study of 800 schools, there is a disproportionate number of charter and private schools in the upper echelons. Does this mean charter and private schools are better?

To answer this question precisely, there would need to be some sort of random assignment of students to private, charter, public and separate schools. I can, however, show whether students attending each type of school perform better than others do, after taking into account their socio-economic environments. Table 3 presents the coefficients that measure performance gaps between separate, private and charter schools relative to public schools.

About 1 percent more students in Grade 3, less in other grades, in the separate school system meet or exceed the standard of excellence than in the public school system (Table 3). This gap is not statistically different from zero, which means that there is no measurable performance gap between separate and public schools in any grade.[9]

In Grade 3, 11.8 percent more students in private schools than in public schools achieve the standard of excellence after controlling for student background. However, there is no statistically significant gap between public school and private school performance in Grade 6 after I take into account the differences in social and economic backgrounds of students. The gap is 6.4 percentage points in Grade 9.

9 In Ontario, separate schools outperform public schools (Johnson and Brydon 2012).

Table 1: Schools with Outstanding Performance Indicators in All Three Grades

School Name	Type	School Authority Name	The Percent of Persons in the School Catchment by Group		
			Aboriginal	*Recent Immigrants*	*Have Some University*
Almadina Language Charter Academy	Charter	Almadina School Society	3.4	9.3	19.9
Aurora School	Charter	Aurora School Ltd.	3.6	4.4	30.5
Clear Vista School	Public	Wetaskiwin Regional Division No. 11	16.7	1.7	11.9
Clear Water Academy	Private	Clear Water Academy Foundation	1.4	2.7	52.2
Covenant Christian School	Public	Black Gold Regional Division No. 18	4.9	0.9	15.5
Glenmore Christian Academy Elementary	Public	Palliser Regional Division No. 26	1.5	4.7	41.7
Grandview Heights School	Public	Edmonton School District No. 7	1.4	4.2	58.6
St. Joseph's School	Separate	Holy Spirit Roman Catholic Separate Regional Division No. 4	1.9	0.6	13.6
Stratford Elementary/ Junior High School	Public	Edmonton School District No. 7	4.4	3.6	32.9
Strathcona-Tweedsmuir School	Private	Strathcona-Tweedsmuir School	1.2	1.8	51.1
Two Hills School	Public	St. Paul Education Regional Division No. 1	2.1	3.8	10.4
Webber Academy	Private	Webber Academy Foundation	1.8	3.3	57.6
		Provincial Average	**6.1**	**2.3**	**21.7**

Notes: 80th percentile or higher, in alphabetical order. Grades 3, 6 and 9.

Source: Author's calculations from Statistics Canada and Alberta Education.

Table 2: Top Performing Schools (90th percentile and up) with Grades 3 and 6

School Name	Type	School Authority Name	The Percent of Persons in the School Catchment by Group		
			Aboriginal	*Recent Immigrants*	*Have Some University*
Aurora School	Charter	Aurora School Ltd.	3.6	4.4	30.5
Calmar Elementary School	Public	Black Gold Regional Division No. 18	0.7	1.8	5.6
Covenant Christian School	Public	Black Gold Regional Division No. 18	4.9	0.9	15.5
St. Philip School	Separate	Calgary Roman Catholic Separate School District No. 1	1.1	2.0	43.8
Alex Ferguson School	Public	Calgary School District No. 19	3.5	5.1	44.8
Nellie McClung School	Public	Calgary School District No. 19	1.3	3.9	48.5
Sunalta School	Public	Calgary School District No. 19	1.6	7.2	51.8
Olds Koinonia Christian School	Public	Chinook's Edge School Division No. 73	2.6	0.8	17.0
Sacred Heart Academy	Separate	Christ the Redeemer Catholic Separate Regional Division No. 3	4.8	0.1	16.8
Clear Water Academy	Private	Clear Water Academy Foundation	1.4	2.7	52.2
Grandview Heights School	Public	Edmonton School District No. 7	1.4	4.2	58.6
Meadowlark School	Public	Edmonton School District No. 7	3.7	3.3	34.9
Meyokumin School	Public	Edmonton School District No. 7	3.7	6.1	27.7
Meyonohk School	Public	Edmonton School District No. 7	3.5	4.9	32.6
Mount Pleasant School	Public	Edmonton School District No. 7	3.1	6.7	41.9
Stratford Elementary/ Junior High School	Public	Edmonton School District No. 7	4.4	3.6	32.9
Westbrook School	Public	Edmonton School District No. 7	2.0	5.2	53.8

Table 2: CONTINUED

School Name	Type	School Authority Name	The Percent of Persons in the School Catchment by Group		
			Aboriginal	*Recent Immigrants*	*Have Some University*
Windsor Park School	Public	Edmonton School District No. 7	1.5	4.3	67.9
St. Joseph's School	Separate	Holy Spirit Roman Catholic Separate Regional Division No. 4	1.9	0.6	13.6
Vanier Community Catholic School	Separate	Living Waters Catholic Regional Division No. 42	7.8	1.0	13.7
A B Daley Community School	Public	Livingstone Range School Division No. 68	0.5	0.1	10.5
Manning Elementary School	Public	Peace River School Division No. 10	2.8	0.0	11.9
Strathcona-Tweedsmuir School	Private	Strathcona-Tweedsmuir School	1.2	1.8	51.1
Suzuki Charter School	Charter	Suzuki Charter School Society	3.6	3.0	33.0
Webber Academy	Private	Webber Academy Foundation	1.8	3.3	57.6
Clear Vista School	Public	Wetaskiwin Regional Division No. 11	16.7	1.7	11.9
		Provincial Averages	**6.1**	**2.3**	**21.7**

Note: In alphabetical order of school authority.

Source: Author's calculations from Statistics Canada and Alberta Education.

Table 3: The Average Difference in the Percent of Students with Excellent Results Relative to Results at Public Schools

Grade	Separate		Private		Charter	
	Estimated Gain in % Excellent	Number of Schools in Sample	Estimated Gain in % Excellent	Number of Schools in Sample	Estimated Gain in % Excellent	Number of Schools in Sample
3	1.1	592	11.8*	23	18.8*	10
6	0.6	554	3.8	22	15.6*	10
9	0.5	317	6.4*	10	14.1*	7

Note: * indicates statistically different from zero at the 5% level.

Source: Author's calculations from Statistics Canada and Alberta Education.

The gap between charter schools and all other schools is large and consistent across all three grades. Students attending these 10 (seven of which offer Grade 9) larger charter schools outperform their counterparts at public, separate and private schools. Why might the gap be so large? First, it is possible that charter schools are able to select the best students out of other schools and reject weaker applicants. Second, charter schools may be able to hire stronger teachers. Third, charter schools with mandates to match the interests of students, teachers and parents may produce better results. The large and persistent gap between the charter school results and the results at other schools, even with controls for observed student background, would seem to merit further investigation.

Conclusion

This analysis addresses, in an easily understood and useful way, potential problems associated with using standardized test results to make a fair comparison of schools. The measures compare schools where students are from similar social and economic backgrounds. There are substantial differences in the performance of students in PAT tests across similar schools. Parents can take these data and applaud the strong performance of high percentile schools as well as question the performance of low percentile schools in which there is no clear reason for such a low relative performance.

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